Side B

JY997D22901P

Side A JAPANESE / Side B ENGLISH

MITSUBISHI *Changes for the Better*

GT1020-L□D(W)/L□D(W)2/L□L(W)

GT10 General Description

GRAPHIC OPERATION TERMINAL GOT1000

Manual Number	JY997D22901P
Date	Jan. 2012

This manual describes the specifications of the product. Before use, read this manual and manuals of relevant products fully to acquire proficiency in handling and operating the product. Make sure to learn all the product information, safety information, and precautions.
And, store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.
Registration
The company name and the product name to be described in this manual are the registered trademarks or trademarks of each company.

Effective Jan. 2012
Specifications are subject to change without notice.

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Safety Precaution (Read these precautions before using.)

Before using this product, please read this manual and the relevant manuals introduced in this manual carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product.
In this manual, the safety precautions are ranked as "DANGER" and "CAUTION".

⚠DANGER	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.

Depending on circumstances, procedures indicated by "CAUTION" may also be linked to serious results.
In any case, it is important to follow the directions for usage.

DESIGN PRECAUTIONS ⚠DANGER

- Some failures of the GOT or cable may keep the outputs on or off.
  An external monitoring circuit should be provided to check for output signals which may lead to a serious accident.
  Not doing so can cause an accident due to false output or malfunction.
- If a communication fault (including cable disconnection) occurs during monitoring on the GOT, communication between the GOT and PLC CPU is suspended and the GOT becomes inoperative.
  A system where the GOT is used should be configured to perform any significant operation to the system by using the switches of a device other than the GOT on the assumption that a GOT communication fault will occur.
  Not doing so can cause an accident due to false output or malfunction.
- Do not use the GOT as the warning device that may cause a serious accident. An independent and redundant hardware or mechanical interlock is required to configure the device that displays and outputs serious warning.
  Failure to observe this instruction may result in an accident due to incorrect output or malfunction.
- Incorrect operation of the touch switch(s) may lead to a serious accident if the GOT backlight is gone out. When the GOT backlight goes out, causes the monitor screen to appear blank, while the input of the touch switch(s) remains active. This may confuse an operator in thinking that the GOT is in "screensaver" mode, who then tries to release the GOT from this mode by touching the display section, which may cause a touch switch to operate.

DESIGN PRECAUTIONS ⚠CAUTION

- Do not bundle the control and communication cables with main-circuit, power or other wiring.
  Run the above cables separately from such wiring and keep them a minimum of 100mm (3.94in.) apart.Not doing so noise can cause a malfunction.
- Do not press the GOT display section with a pointed material as a pen or driver. Doing so can result in a damage or failure of the display section.
- Before connecting to GOT, turn ON the controller to enable the communication. When the communication of controller is not available, a communication error may occur in GOT.

MOUNTING PRECAUTIONS ⚠DANGER

- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the GOT to/from the panel.
  Not doing so can cause the unit to fail or malfunction.

MOUNTING PRECAUTIONS ⚠CAUTION

- Use the GOT in the environment that satisfies the general specifications described in this manual. Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.
- When mounting the GOT to the control panel, tighten the mounting screws in the specified torque range. Undertightening can cause the GOT to drop, short circuit or malfunction, and deteriorate the waterproof effect and oilproof effect. Overtightening can cause a drop, short circuit or malfunction due to the damage of the screws or the GOT, and deteriorate the waterproof effect and oilproof effect due to distortion of the protective cover for oil, GOT or panel.
- When using the GOT in the environment of oil or chemicals, use the protective cover for oil. Failure to do so may cause failure or malfunction due to the oil or chemical entering into the GOT.

WIRING PRECAUTIONS ⚠DANGER

- Be sure to shut off all phases of the external power supply used by the system before wiring. Failure to do so may result in an electric shock, product damage or malfunctions.
- Please make sure to ground FG terminal of the GOT power supply section by applying 100 or less which is used exclusively for the GOT. Not doing so may cause an electric shock or malfunction.
- Correctly wire the GOT power supply section after confirming the rated voltage and terminal arrangement of the product. Not doing so can cause a fire or failure.
- Tighten the terminal screws of the GOT power supply section in the specified torque range. Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or the GOT.
- Exercise care to avoid foreign matter such as chips and wire offcuts entering the GOT. Not doing so can cause a fire, failure or malfunction.

WIRING PRECAUTIONS ⚠CAUTION

- Plug the communication cable into the connector of the connected unit and tighten the mounting and terminal screws in the specified torque range.
  Undertightening can cause a short circuit or malfunction. Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

TEST OPERATION PRECAUTIONS ⚠DANGER

- Before performing the test operations of the user creation monitor screen (such as turning ON or OFF bit device, changing the word device current value, changing the settings or current values of the timer or counter), read through the manual carefully and make yourself familiar with the operation method.
  During test operation, never change the data of the devices which are used to perform significant operation for the system. False output or malfunction can cause an accident.

STARTUP/MAINTENANCE PRECAUTIONS ⚠DANGER

- When power is on, do not touch the terminals.
  Doing so can cause an electric shock or malfunction.
- Before starting cleaning or terminal screw retightening, always switch off the power externally in all phases. Not switching the power off in all phases can cause a unit failure or malfunction. Undertightening can cause a short circuit or malfunction. Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

STARTUP/MAINTENANCE PRECAUTIONS ⚠CAUTION

- Do not disassemble or modify the unit.
  Doing so can cause a failure, malfunction, injury or fire.
- Do not touch the conductive and electronic parts of the unit directly.
  Doing so can cause a unit malfunction or failure.
- The cables connected to the unit must be run in ducts or clamped.
  Not doing so can cause the unit or cable to be damaged due to the dangling, motion or accidental pulling of the cables or can cause a malfunction due to a cable connection fault.
- When unplugging the cable connected to the unit, do not hold and pull the cable portion. Doing so can cause the unit or cable to be damaged or can cause a malfunction due to a cable connection fault.
- Before touching the unit, always touch grounded metal, etc. to discharge static electricity from human body, etc.
  Not doing so can cause the unit to fail malfunction.

DISPOSAL PRECAUTIONS ⚠CAUTION

- When disposing of the product, handle it as industrial waste.

TOUCH PANEL PRECAUTIONS ⚠CAUTION

- For the analog-resistive film type touch panels, normally the adjustment is not required. However, the difference between a touched position and the object position may occur as the period of use elapses. When any difference between a touched position and the object position occurs, execute the touch panel calibration.
- When any difference between a touched position and the object position occurs, other object may be activated. This may cause an unexpected operation due to incorrect output or malfunction.

TRANSPORTATION PRECAUTIONS ⚠CAUTION

- Make sure to transport the GOT main unit and/or relevant unit(s) in the manner they will not be exposed to the impact exceeding the impact resistance described in the general specifications of this manual, as they are precision devices. Failure to do so may cause the unit to fail.
  Check if the unit operates correctly after transportation.

Compliance with EC directive (CE Marking)

This note does not guarantee that an entire mechanical module produced in accordance with the contents of this note will comply with the following standards. Compliance to EMC directive for the entire mechanical module should be checked by the user / manufacturer. For more details please contact the local Mitsubishi Electric sales site.

Attention

- This product is designed for use in industrial applications.
- Manufactured by: Mitsubishi Electric Corporation
  2-7-3 Marunouchi, Chiyoda-ku, Tokyo 100-8310 Japan
- Manufactured at: Mitsubishi Electric Corporation Himeji Works
  840 Chiyoda-machi, Himeji, Hyogo 670-8677 Japan
- Authorized Representative in the European Community:
  Mitsubishi Electric Europe B.V.
  Gothaer Str. 8, 40880 Ratingen, Germany.

Requirement for Compliance with EMC directive

The following products have shown compliance through direct testing (to the identified standards) and design analysis (forming a technical construction file) to the European Directive for Electromagnetic Compatibility (2004/108/EC) when used as directed by the appropriate documentation.
Type :Programmable Controller (Open Type Equipment)

Standard		Remark
EN61131-2 : 2007 Programmable controllers-Equipment, requirement and tests	EMI	Compliance with all relevant aspects of the standard. (Radiated Emissions)
	EMS	Compliance with all relevant aspects of the standard. (ESD,RF electromagnetic field, EFTB, Surge, RF conducted disturbances and Power frequency magnetic field)

For more details please contact the local Mitsubishi Electric sales site.

Notes for compliance to EMC regulation

1) General notes on the use of communication cables
   Any device which utilizes a data communication function is susceptible to the wider effects of local EMC noise. Therefore, when installing any communication cables care should always be taken with the routing and location of those cables. The GOT units identified on the previous chapter are compliant with the EMC requirement when the following communication cables are used.

GOT Unit	Existing Cables
GT1020-LBD/LWD, GT1020-LBL/LWL, GT1020-LBDW/LWDW, GT1020-LBLW/LWLW	GT10-C30R4-8P (For Melsec FX series PLC)
GT1020-LBD2/LWD2, GT1020-LBDW2/LWDW2	GT10-C30R2-6P (For Melsec Q series PLC)

2) General notes on the use of the power cable
   The GT1020-LBD/LWD/LBD2/LWD2/LBDW/LWDW/LBDW2/LWDW2 unit demand that the cable for the power supply is 10m or less.

Associated Manuals

Manual name	Contents	Manual Number (Model Code)
GT10 User's Manual (sold separately)	Describes the GT10 hardware-relevant content such as part names, external dimensions, mounting, power supply wiring, specifications, and introduction to option devices	JY997D24701 (09R819)
GOT1000 Series Connection Manual 1/3, 2/3, 3/3 (sold separately) *1	Describes system configurations of the connection method applicable to GOT1000 series and cable creation method	SH-080532ENG (1D7M26)
GT Designer2 Version2 Basic Operation/Data Transfer Manual (For GOT1000 Series) (sold separately) *1	Describes methods of the GT Designer2 installation operation, basic operation for drawing and transmitting data to GOT1000 series	SH-080529ENG (1D7M24)
GT Designer2 Version2 Screen Design Manual (For GOT1000 Series) 1/3, 2/3, 3/3 (sold separately) *1	Describes specifications and settings of the object functions used in GT Designer2	SH-080530ENG SH-080531ENG (1D7M25)
GT Designer3 Version1 Screen Design Manual (For GOT1000 Series) (Fundamentals) 1/2, 2/2 (sold separately) *1	Describes methods of the GT Designer3 installation operation, basic operation for drawing and transmitting data to GOT1000 series	SH-080866ENG (1D7MB9)
GT Designer3 Version1 Screen Design Manual (For GOT1000 Series) (Functions) 1/2, 2/2 (sold separately) *1	Describes specifications and settings of the object functions used in GT Designer3	SH-080867ENG (1D7MC1)

*1 Stored in the GT Works2/GT Designer2/GT Works3/GT Designer3 in PDF format.
For details of a PLC to be connected, refer to the PLC user's manual respectively.

Bundled Items

Model Name	Remark
GT1020-LBD/LWD	GOT main unit (The maintenance supplies below are packed with the product.)
GT1020-LBD2/LWD2	
GT1020-LBL/LWL	
GT1020-LBDW/LWDW	
GT1020-LBDW2/LWDW2	
GT1020-LBLW/LWLW	

Maintenance Supplies	Quantity
PLC Communication Connector	1
Panel Mounting Bracket (with M4 × 20 screws)	4
Panel Mounting Packing	1
GT10 General Description (This manual)	1

Explanation of the GOT model name

GT10 2 0 - * * * * *

- Interface type for communication with PLC: 2:RS-232, Blank:RS-422
- Backlight type: W:white/red/pink, Blank:green/red/orange
- Power type: D:24VDC, L:5VDC
- Panel color type: B:Black, W:White
- Display device type: L:STN monochrome
- Display color type: 0:Monochrome(black/white)
- Screen size type: 2:3.7"
- GOT1000 series: GT10

1. Specifications

1.1 General Specifications

Item		Specifications					
		GT1020-LBD/LWD/LBD2/LWD2/LBL/LWL/LBDW/LWDW/LBDW2/LWDW2/LBLW/LWLW					
Operating ambient temperature	Display section	0 to 50°C					
	Other than display section	0 to 55°C (When mounted horizontally), 0 to 50°C (When mounted vertically)					
Storage ambient temperature		-20 to 60°C					
Operating/Storage ambient humidity		10 to 90% RH, non-condensing (The wet bulb temperature is 39°C or less.)					
Vibration resistance		Conforms to JIS B3502 and IEC61131-2		Frequency	Acceleration	Half-amplitude	Sweep Count
			Under intermittent vibration	5 to 9Hz	--	3.5mm	10 times each in X, Y and Z directions
				9 to 150Hz	9.8m/s^2	--	
			Under continuous vibration	5 to 9Hz	--	1.75mm	
				9 to 150Hz	4.9m/s^2	--	
Shock resistance		Conforms to JIS B3502, IEC 61131-2 (147m/s^2, 11 ms, Sine half-wave pulse, 3 times each in the X, Y, and Z directions.)					
Operating atmosphere		Must be free of lamp black, corrosive gas, flammable gas, or excessive amount of electro conductive dust particles and must be no direct sunlight. (Same as for saving)					
Operating altitude*1		2000 m (6562 ft) max.					
Installation location		Inside control panel					
Overvoltage category*2		II or less					
Pollution degree*3		2 or less					
Cooling method		Self-cooling					

*1 Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0m (0ft.). Failure to observe this instruction may cause a malfunction.
When the air inside the control panel is purged by pressurization, the surface sheet may be lifted by high pressure. As a result, the touch panel may be difficult to press, and the sheet may be peeled off.

*2 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within the premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities.
The surge voltage withstand level for up to the raged voltage of 300 V is 2500 V.

*3 This index indicates the degree to which conductive material is generated in the environment where the equipment is used.
In pollution degree 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensation.

1.2 Performance Specifications

Item		Specifications			
		GT1020-LBD/LWD/LBD2/LWD2	GT1020-LBL/LWL	GT1020-LBDW/LWDW/LBDW2/LWDW2	GT1020-LBLW/LWLW
Display section*1	Type	STN monochrome (white/black) liquid crystal			
	Screen size	3.7"			
	Resolution	160 × 64 dots (Horizontal format)			
	Display size	W86.4(3.4) × H34.5(1.35) [mm](inch) (Horizontal format)			
	Display character	16-dot standard font: 20 characters × 4 lines (Horizontal format)			
	Display color	Monochrome (white/black)			
	Display angle	Left/Right: 30 degrees, Top: 20 degrees, Bottom: 30 degrees (Horizontal format)			
	Contrast adjustment	16-level adjustment			
	Intensity of LCD only	200 [cd/m^2] (in green)		300 [cd/m^2] (in white)	
	Life	Approx. 50,000h. (Time for display intensity to become 1/5 at operating ambient temperature of 25°C)			
Backlight (no replacement required)		LED with 3 available colors (green, red, orange)		LED with 3 available colors (white, red, pink)	
		Backlight status (colors, ON/BLINK/OFF) control, Adjustable screensaver activation time Setting the system information enables*2 PLC to control the backlight status			
Touch panel	Number of touch keys	Maximum 50 keys/screen (Analog resistive film touch panel)			
	Key size	Minimum 2 × 2 dots (per key)			
	Simultaneous pressing of two (or more) areas (2-point press)	Not supported (Simultaneous pressing of two or more areas on the screen may activate the switch between those areas.)			
	Life	1 million times or more (operating force 0.98N max.)			
Memory	C drive*3	Flash memory ROM (Internal), for storing Project data (512kbytes or less), OS, Alarm history and Recipe data			
	Life (Number of write times)	100,000 times			
Buzzer output (a buzzer that sounds when touch keys are pressed)		Single tone (LONG/ SHORT/ OFF adjustable)			
Environmental protective structure*4		Equivalent to IP67 (JEM1030) (front section)			
External dimensions		W113(4.44) × H74(2.91) × D27(1.06)[mm](inch) (Excluding mounting fixtures) (Horizontal format)			
Panel cutting dimensions		W105 (4.13) × H66 (2.59) [mm] (inch) (Horizontal format)			
Weight (Excluding mounting fixtures)		0.2kg	0.18kg	0.2kg	0.18kg
Compatible software package		GT Designer2 Version2.43V or later/ GT Designer3 Version1.01B or later		GT Designer2 Version2.58L or later/ GT Designer3 Version1.01B or later	

*1 • Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. Flickers may be observed depending on the display color. Please note that these dots appear due to its characteristic and are not caused by product defect.
• Flickers and partial discoloration may be generated on the liquid crystal display panel due to the display contents or the contrast adjustment. However, please note that these phenomena appear due to its characteristic and are not caused by product defect.
• There is a difference in the display brightness and the color tones between liquid crystal display panels. When using multiple liquid crystal display panels, please note that there is an individual difference between them.
• A crosstalk (shadow as an extension of the display) may appear on the liquid crystal display panel. Please note that it appears due to its characteristic.
• When the display section is seen from the outside of the display angle, the display color seems like it has changed.
Please note that it is due to its characteristic. Please note that the response time, brightness and color of the liquid crystal display panel may vary depending on the usage environmental temperature.
Especially in the low temperature environment, the display response becomes slow due to the characteristics of the STN liquid crystal.
Please check the display response in advance for using this product.
• When the same screen is displayed for a long time, an incidental color or partial discoloration is generated on the screen due to heat damage, and it may not disappear. To prevent heat damage, the screen saver function is effective. For details on the screen saver function, refer to the following.
→ GT10 User's Manual

*2 For the details of system information, refer to the following.
→ GT Designer2 VersionC Screen Design Manual
GT Designer3 Version1 Screen Design Manual

*3 ROM in which new data can be written without deleting the written data.

*4 Note that this does not guarantee all users' operation environment.
In addition, the product may not be used in environments under exposition of oil or chemicals for a long period of time, or in environments filled with oil-mist.

1.3 Communication Specifications

Item		Specifications		
		GT1020-LBD/LWD/LBDW/LWDW	GT1020-LBD2/LWD2/LBDW2/LWDW2	GT1020-LBL/LWL/LBLW/LWLW
PLC communication	Communication standard	RS-422/485, 1ch	RS-232, 1ch	RS-422, 1ch
	Transmission speed	115,200/57,600/38,400/19,200/9,600/4,800bps		
	Connector shape	Connector terminal block 9-pins		
	Terminating resistor*1	Open/110Ω/330Ω (Switched by terminating resistor selector switch) (At factory shipment: 330Ω)	--	--
PC communication*2	Communication standard	RS-232, 1ch		
	Transmission speed	115,200/57,600/38,400/19,200/9,600/4,800bps		
	Connector shape	MINI DIN 6-pins (Female)		

*1 Set the terminating resistor selector switch of the GOT in accordance with the connection type when adopting GOT multidrop connection. For details of GOT multidrop connection, refer to the following.
→ GOT1000 Series Connection Manual

*2 Project data upload/download, OS installation, Transparent function

1.4 Power Supply Specifications

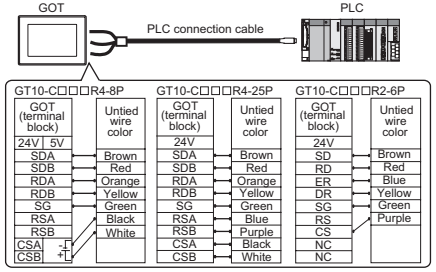
(For details on power supply wiring, such as the allowable cable size and tightening torque, refer to the additional manual, "GT10 User's Manual".)

Item	Specifications	
	GT1020-LBD/LWD/LBD2/LWD2/LBDW/LWDW/LBDW2/LWDW2	GT1020-LBL/LWL/LBLW/LWLW
Input power supply voltage	24VDC (+10% -15%), ripple voltage 200mV or less	5VDC (±5%), supplied from the PLC
Fuse (built-in, not exchangeable)	0.4A	–
Power consumption, (At backlight off)	1.9W (80mA/24VDC) or less, (1.2W (50mA/24VDC) or less)	1.1W (220mA/5VDC) or less, (0.6W (120mA/5VDC) or less)
Inrush current	13A or less (26.4VDC) 1ms	–
Permissible instantaneous power failure time*1	Within 5ms	–
Noise immunity	Noise voltage: 1000Vp-p, Noise width: 1μs (by noise simulator of 30 to 100Hz noise frequency)	
Dielectric withstand voltage	500VAC for 1 minute (between the GOT's power supply terminals and the GOT's grounding terminal)	–
Insulation resistance	10MΩ or larger by insulation resistance tester (between the GOT's power supply terminals and the GOT's grounding terminal)	–
Grounding	Class D grounding (100Ω or less). To be connected to the panel when grounding is not possible	–

*1 The GOT continues to operate even upon 5ms or shorter instantaneous power failure. The GOT stops operating if there is extended power failure or voltage drop, while it automatically resumes operation as soon as the power is restored.

2. Wiring of connection cable

The diagram below shows cable assignment for GOT port.
Cables: GT10-C□□□R4-8P, GT10-C□□□R4-2P, GT10-C□□□R2-6P



User-made cable is necessary, depending on the PLC.
For the detail, refer to GOT1000 Series Connection Manual.

Cable jacket to remove	7mm (0.27")
Tightening torque	0.22 to 0.25 N•m
Recommended Tool (Screwdriver)	SZS 0.4 × 2.5 (Phoenix Contact Inc.)

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

Warranty
Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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  Failure to observe this instruction may result in an accident due to incorrect output or malfunction.
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- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the GOT to/from the panel.
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- Use the GOT in the environment that satisfies the general specifications described in this manual. Not doing so can cause an electric shock, fire, malfunction or product damage or deterioration.
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- When using the GOT in the environment of oil or chemicals, use the protective cover for oil. Failure to do so may cause failure or malfunction due to the oil or chemical entering into the GOT.

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- Be sure to shut off all phases of the external power supply used by the system before wiring. Failure to do so may result in an electric shock, product damage or malfunctions.
- Please make sure to ground FG terminal of the GOT power supply section by applying 100 or less which is used exclusively for the GOT. Not doing so may cause an electric shock or malfunction.
- Correctly wire the GOT power supply section after confirming the rated voltage and terminal arrangement of the product. Not doing so can cause a fire or failure.
- Tighten the terminal screws of the GOT power supply section in the specified torque range. Undertightening can cause a short circuit or malfunction.
  Overtightening can cause a short circuit or malfunction due to the damage of the screws or the GOT.
- Exercise care to avoid foreign matter such as chips and wire offcuts entering the GOT. Not doing so can cause a fire, failure or malfunction.

WIRING PRECAUTIONS ⚠CAUTION

- Plug the communication cable into the connector of the connected unit and tighten the mounting and terminal screws in the specified torque range.
  Undertightening can cause a short circuit or malfunction. Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

TEST OPERATION PRECAUTIONS ⚠DANGER

- Before performing the test operations of the user creation monitor screen (such as turning ON or OFF bit device, changing the word device current value, changing the settings or current values of the timer or counter), read through the manual carefully and make yourself familiar with the operation method.
  During test operation, never change the data of the devices which are used to perform significant operation for the system. False output or malfunction can cause an accident.

STARTUP/MAINTENANCE PRECAUTIONS ⚠DANGER

- When power is on, do not touch the terminals.
  Doing so can cause an electric shock or malfunction.
- Before starting cleaning or terminal screw retightening, always switch off the power externally in all phases. Not switching the power off in all phases can cause a unit failure or malfunction. Undertightening can cause a short circuit or malfunction. Overtightening can cause a short circuit or malfunction due to the damage of the screws or unit.

STARTUP/MAINTENANCE PRECAUTIONS ⚠CAUTION

- Do not disassemble or modify the unit.
  Doing so can cause a failure, malfunction, injury or fire.
- Do not touch the conductive and electronic parts of the unit directly.
  Doing so can cause a unit malfunction or failure.
- The cables connected to the unit must be run in ducts or clamped.
  Not doing so can cause the unit or cable to be damaged due to the dangling, motion or accidental pulling of the cables or can cause a malfunction due to a cable connection fault.
- When unplugging the cable connected to the unit, do not hold and pull the cable portion. Doing so can cause the unit or cable to be damaged or can cause a malfunction due to a cable connection fault.
- Before touching the unit, always touch grounded metal, etc. to discharge static electricity from human body, etc.
  Not doing so can cause the unit to fail malfunction.

DISPOSAL PRECAUTIONS ⚠CAUTION

- When disposing of the product, handle it as industrial waste.

TOUCH PANEL PRECAUTIONS ⚠CAUTION

- For the analog-resistive film type touch panels, normally the adjustment is not required. However, the difference between a touched position and the object position may occur as the period of use elapses. When any difference between a touched position and the object position occurs, execute the touch panel calibration.
- When any difference between a touched position and the object position occurs, other object may be activated. This may cause an unexpected operation due to incorrect output or malfunction.

TRANSPORTATION PRECAUTIONS ⚠CAUTION

- Make sure to transport the GOT main unit and/or relevant unit(s) in the manner they will not be exposed to the impact exceeding the impact resistance described in the general specifications of this manual, as they are precision devices. Failure to do so may cause the unit to fail.
  Check if the unit operates correctly after transportation.

Compliance with EC directive (CE Marking)

This note does not guarantee that an entire mechanical module produced in accordance with the contents of this note will comply with the following standards. Compliance to EMC directive for the entire mechanical module should be checked by the user / manufacturer. For more details please contact the local Mitsubishi Electric sales site.

Attention

- This product is designed for use in industrial applications.
- Manufactured by: Mitsubishi Electric Corporation
  2-7-3 Marunouchi, Chiyoda-ku, Tokyo 100-8310 Japan
- Manufactured at: Mitsubishi Electric Corporation Himeji Works
  840 Chiyoda-machi, Himeji, Hyogo 670-8677 Japan
- Authorized Representative in the European Community:
  Mitsubishi Electric Europe B.V.
  Gothaer Str. 8, 40880 Ratingen, Germany.

Requirement for Compliance with EMC directive

The following products have shown compliance through direct testing (to the identified standards) and design analysis (forming a technical construction file) to the European Directive for Electromagnetic Compatibility (2004/108/EC) when used as directed by the appropriate documentation.
Type :Programmable Controller (Open Type Equipment)

Standard		Remark
EN61131-2 : 2007 Programmable controllers-Equipment, requirement and tests	EMI	Compliance with all relevant aspects of the standard. (Radiated Emissions)
	EMS	Compliance with all relevant aspects of the standard. (ESD,RF electromagnetic field, EFTB, Surge, RF conducted disturbances and Power frequency magnetic field)

For more details please contact the local Mitsubishi Electric sales site.

Notes for compliance to EMC regulation

1) General notes on the use of communication cables
   Any device which utilizes a data communication function is susceptible to the wider effects of local EMC noise. Therefore, when installing any communication cables care should always be taken with the routing and location of those cables. The GOT units identified on the previous chapter are compliant with the EMC requirement when the following communication cables are used.

GOT Unit	Existing Cables
GT1020-LBD/LWD, GT1020-LBL/LWL, GT1020-LBDW/LWDW, GT1020-LBLW/LWLW	GT10-C30R4-8P (For Melsec FX series PLC)
GT1020-LBD2/LWD2, GT1020-LBDW2/LWDW2	GT10-C30R2-6P (For Melsec Q series PLC)

2) General notes on the use of the power cable
   The GT1020-LBD/LWD/LBD2/LWD2/LBDW/LWDW/LBDW2/LWDW2 unit demand that the cable for the power supply is 10m or less.

Associated Manuals

Manual name	Contents	Manual Number (Model Code)
GT10 User's Manual (sold separately)	Describes the GT10 hardware-relevant content such as part names, external dimensions, mounting, power supply wiring, specifications, and introduction to option devices	JY997D24701 (09R819)
GOT1000 Series Connection Manual 1/3, 2/3, 3/3 (sold separately) *1	Describes system configurations of the connection method applicable to GOT1000 series and cable creation method	SH-080532ENG (1D7M26)
GT Designer2 Version2 Basic Operation/Data Transfer Manual (For GOT1000 Series) (sold separately) *1	Describes methods of the GT Designer2 installation operation, basic operation for drawing and transmitting data to GOT1000 series	SH-080529ENG (1D7M24)
GT Designer2 Version2 Screen Design Manual (For GOT1000 Series) 1/3, 2/3, 3/3 (sold separately) *1	Describes specifications and settings of the object functions used in GT Designer2	SH-080530ENG SH-080531ENG (1D7M25)
GT Designer3 Version1 Screen Design Manual (For GOT1000 Series) (Fundamentals) 1/2, 2/2 (sold separately) *1	Describes methods of the GT Designer3 installation operation, basic operation for drawing and transmitting data to GOT1000 series	SH-080866ENG (1D7MB9)
GT Designer3 Version1 Screen Design Manual (For GOT1000 Series) (Functions) 1/2, 2/2 (sold separately) *1	Describes specifications and settings of the object functions used in GT Designer3	SH-080867ENG (1D7MC1)

*1 Stored in the GT Works2/GT Designer2/GT Works3/GT Designer3 in PDF format.
For details of a PLC to be connected, refer to the PLC user's manual respectively.

Bundled Items

Model Name	Remark
GT1020-LBD/LWD	GOT main unit (The maintenance supplies below are packed with the product.)
GT1020-LBD2/LWD2	
GT1020-LBL/LWL	
GT1020-LBDW/LWDW	
GT1020-LBDW2/LWDW2	
GT1020-LBLW/LWLW	

Maintenance Supplies	Quantity
PLC Communication Connector	1
Panel Mounting Bracket (with M4 × 20 screws)	4
Panel Mounting Packing	1
GT10 General Description (This manual)	1

Explanation of the GOT model name

GT10 2 0 - * * * * * *

- Interface type for communication with PLC: 2:RS-232, Blank:RS-422
- Backlight type: W:white/red/pink, Blank:green/red/orange
- Power type: D:24VDC, L:5VDC
- Panel color type: B:Black, W:White
- Display device type: L:STN monochrome
- Display color type: 0:Monochrome(black/white)
- Screen size type: 2:3.7"
- GOT1000 series: GT10

1. Specifications

1.1 General Specifications

Item		Specifications: GT1020-LBD/LWD/LBD2/LWD2/LBL/LWL/LBDW/LWDW/LBDW2/LWDW2/LBLW/LWLW
Operating ambient temperature	Display section	0 to 50°C
	Other than display section	0 to 55°C (When mounted horizontally), 0 to 50°C (When mounted vertically)
Storage ambient temperature		-20 to 60°C
Operating/Storage ambient humidity		10 to 90% RH, non-condensing (The wet bulb temperature is 39°C or less.)
Vibration resistance		Conforms to JIS B3502 and IEC61131-2

	Frequency	Acceleration	Half-amplitude	Sweep Count
Under intermittent vibration	5 to 9Hz	--	3.5mm	10 times each in X, Y and Z directions
	9 to 150Hz	9.8m/s²	--	
Under continuous vibration	5 to 9Hz	--	1.75mm	
	9 to 150Hz	4.9m/s²	--	

Shock resistance	Conforms to JIS B3502, IEC 61131-2 (147m/s², 11 ms, Sine half-wave pulse, 3 times each in the X, Y, and Z directions.)
Operating atmosphere	Must be free of lamp black, corrosive gas, flammable gas, or excessive amount of electro conductive dust particles and must be no direct sunlight. (Same as for saving)
Operating altitude*1	2000 m (6562 ft) max.
Installation location	Inside control panel
Overvoltage category*2	II or less
Pollution degree*3	2 or less
Cooling method	Self-cooling

*1 Do not use or store the GOT under pressure higher than the atmospheric pressure of altitude 0m (0ft.). Failure to observe this instruction may cause a malfunction.
When the air inside the control panel is purged by pressurization, the surface sheet may be lifted by high pressure. As a result, the touch panel may be difficult to press, and the sheet may be peeled off.

*2 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within the premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities.
The surge voltage withstand level for up to the raged voltage of 300 V is 2500 V.

*3 This index indicates the degree to which conductive material is generated in the environment where the equipment is used.
In pollution degree 2, only non-conductive pollution occurs but temporary conductivity may be produced due to condensation.

1.2 Performance Specifications

Item		Specifications: GT1020-LBD/LWD/LBD2/LWD2	GT1020-LBL/LWL	GT1020-LBDW/LWDW/LBDW2/LWDW2	GT1020-LBLW/LWLW
Display section*1	Type	STN monochrome (white/black) liquid crystal			
	Screen size	3.7"			
	Resolution	160 × 64 dots (Horizontal format)			
	Display size	W86.4(3.4) × H34.5(1.35) [mm](inch) (Horizontal format)			
	Display character	16-dot standard font: 20 characters × 4 lines (Horizontal format)			
	Display color	Monochrome (white/black)			
	Display angle	Left/Right: 30 degrees, Top: 20 degrees, Bottom: 30 degrees (Horizontal format)			
	Contrast adjustment	16-level adjustment			
	Intensity of LCD only	200 [cd/m²] (in green)		300 [cd/m²] (in white)	
	Life	Approx. 50,000h. (Time for display intensity to become 1/5 at operating ambient temperature of 25°C)			
Backlight (no replacement required)		LED with 3 available colors (green, red, orange)		LED with 3 available colors (white, red, pink)	
		Backlight status (colors, ON/BLINK/OFF) control, Adjustable screensaver activation time Setting the system information enables*2 PLC to control the backlight status			
Touch panel	Number of touch keys	Maximum 50 keys/screen (Analog resistive film touch panel)			
	Key size	Minimum 2 × 2 dots (per key)			
	Simultaneous pressing of two (or more) areas (2-point press)	Not supported (Simultaneous pressing of two or more areas on the screen may activate the switch between those areas.)			
	Life	1 million times or more (operating force 0.98N max.)			
Memory	C drive*3	Flash memory ROM (Internal), for storing Project data (512kbytes or less), OS, Alarm history and Recipe data			
	Life (Number of write times)	100,000 times			
Buzzer output (a buzzer that sounds when touch keys are pressed)		Single tone (LONG/ SHORT/ OFF adjustable)			
Environmental protective structure*4		Equivalent to IP67 (JEM1030) (front section)			
External dimensions		W113(4.44) × H74(2.91) × D27(1.06)[mm](inch) (Excluding mounting fixtures) (Horizontal format)			
Panel cutting dimensions		W105 (4.13) × H66 (2.59) [mm] (inch) (Horizontal format)			
Weight (Excluding mounting fixtures)		0.2kg	0.18kg	0.2kg	0.18kg
Compatible software package		GT Designer2 Version2.43V or later/ GT Designer3 Version1.01B or later		GT Designer2 Version2.58L or later/ GT Designer3 Version1.01B or later	

*1 • Bright dots (always lit) and dark dots (unlit) may appear on a liquid crystal display panel. It is impossible to completely avoid this symptom, as the liquid crystal display comprises of a great number of display elements. Flickers may be observed depending on the display color. Please note that these dots appear due to its characteristic and are not caused by product defect.
• Flickers and partial discoloration may be generated on the liquid crystal display panel due to the display contents or the contrast adjustment. However, please note that these phenomena appear due to its characteristic and are not caused by product defect.
• There is a difference in the display brightness and the color tones between liquid crystal display panels. When using multiple liquid crystal display panels, please note that there is an individual difference between them.
• A crosstalk (shadow as an extension of the display) may appear on the liquid crystal display panel. Please note that it appears due to its characteristic.
• When the display section is seen from the outside of the display angle, the display color seems like it has changed.
Please note that it is due to its characteristic. Please note that the response time, brightness and color of the liquid crystal display panel may vary depending on the usage environmental temperature.
Especially in the low temperature environment, the display response becomes slow due to the characteristics of the STN liquid crystal.
Please check the display response in advance for using this product.
• When the same screen is displayed for a long time, an incidental color or partial discoloration is generated on the screen due to heat damage, and it may not disappear. To prevent heat damage, the screen saver function is effective. For details on the screen saver function, refer to the following.
→ GT10 User's Manual

*2 For the details of system information, refer to the following.
→ GT Designer2 Version□ Screen Design Manual
GT Designer3 Version1 Screen Design Manual

*3 ROM in which new data can be written without deleting the written data.

*4 Note that this does not guarantee all users' operation environment.
In addition, the product may not be used in environments under exposition of oil or chemicals for a long period of time, or in environments filled with oil-mist.

1.3 Communication Specifications

Item		Specifications: GT1020-LBD/LWD/LBDW/LWDW	GT1020-LBD2/LWD2/LBDW2/LWDW2	GT1020-LBL/LWL/LBLW/LWLW
PLC communication	Communication standard	RS-422/485, 1ch	RS-232, 1ch	RS-422, 1ch
	Transmission speed	115,200/57,600/38,400/19,200/9,600/4,800bps		
	Connector shape	Connector terminal block 9-pins		
	Terminating resistor*1	Open/110Ω/330Ω (Switched by terminating resistor selector switch) (At factory shipment: 330Ω)	--	--
PC communication*2	Communication standard	RS-232, 1ch		
	Transmission speed	115,200/57,600/38,400/19,200/9,600/4,800bps		
	Connector shape	MINI DIN 6-pins (Female)		

*1 Set the terminating resistor selector switch of the GOT in accordance with the connection type when adopting GOT multidrop connection. For details of GOT multidrop connection, refer to the following.
→ GOT1000 Series Connection Manual

*2 Project data upload/download, OS installation, Transparent function

1.4 Power Supply Specifications

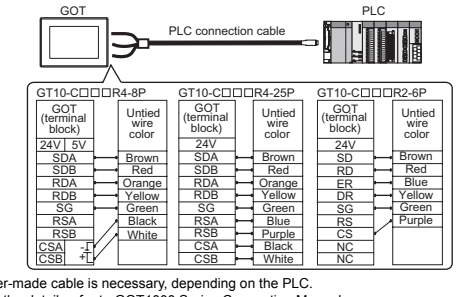
(For details on power supply wiring, such as the allowable cable size and tightening torque, refer to the additional manual, "GT10 User's Manual".)

Item	Specifications: GT1020-LBD/LWD/LBD2/LWD2/LBDW/LWDW/LBDW2/LWDW2	GT1020-LBL/LWL/LBLW/LWLW
Input power supply voltage	24VDC (+10% -15%), ripple voltage 200mV or less	5VDC (±5%), supplied from the PLC
Fuse (built-in, not exchangeable)	0.4A	–
Power consumption, (At backlight off)	1.9W (80mA/24VDC) or less, (1.2W (50mA/24VDC) or less)	1.1W (220mA/5VDC) or less, (0.6W (120mA/5VDC) or less)
Inrush current	13A or less (26.4VDC) 1ms	–
Permissible instantaneous power failure time*1	Within 5ms	–
Noise immunity	Noise voltage: 1000Vp-p, Noise width: 1μs (by noise simulator of 30 to 100Hz noise frequency)	
Dielectric withstand voltage	500VAC for 1 minute (between the GOT's power supply terminals and the GOT's grounding terminal)	–
Insulation resistance	10MΩ or larger by insulation resistance tester (between the GOT's power supply terminals and the GOT's grounding terminal)	–
Grounding	Class D grounding (100Ω or less). To be connected to the panel when grounding is not possible	–

*1 The GOT continues to operate even upon 5ms or shorter instantaneous power failure. The GOT stops operating if there is extended power failure or voltage drop, while it automatically resumes operation as soon as the power is restored.

2. Wiring of connection cable

The diagram below shows cable assignment for GOT port.
Cables: GT10-C□□□R4-8P, GT10-C□□□R4-2P, GT10-C□□□R2-6P



User-made cable is necessary, depending on the PLC.
For the detail, refer to GOT1000 Series Connection Manual.

Cable jacket to remove	7mm (0.27")
Tightening torque	0.22 to 0.25 N•m
Recommended Tool (Screwdriver)	SZS 0.4 × 2.5 (Phoenix Contact Inc.)

This manual confers no industrial property rights or any rights of any other kind, nor does it confer any patent licenses. Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

Warranty
Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; opportunity loss or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric.
- This product has been manufactured under strict quality control. However when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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